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EXAMINER

WOZNIAK, JAMES S

ART UNIT PAPER NUMBER

2655

DATE MAILED: 03/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/972,929

Applicant(s)

ROSE ET AL.

Examiner

James S. Wozniak

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14, 16, 21, 23 and 24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14, 16, 21, 23 and 24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

1. In response to the office action from 9/27/2005, the applicant has submitted an amendment, filed 12/16/2005, amending claims 1, 5, 9, 13-14, while canceling claims 15, 17-20, and 22 and arguing to traverse the art rejection based on the limitation regarding increasing periodic time when sampled noise information does not exceed a threshold value. (*Amendment, Pages 8-10*). Applicant's arguments have been fully considered, however the previous rejection is maintained, altered with respect to the amended claims and due to the reasons listed below in the response to arguments.

### ***Response to Arguments***

2. Applicant's arguments have been fully considered but they are not persuasive for the following reasons:

With respect to the independent claims, the applicant argues that Kosanovic (*U.S. Patent: 6,157,670*) fails to teach increasing periodic time when sampled noise information does not exceed a threshold value (*Amendment, Pages 8-10*). In response, the examiner notes that Kosanovic teaches adjusting a noise updating period based on signal energy or parameters (Col. 3, Lines 42-65). Kosanovic further teaches that a signal contains speech and noise information (*Col. 1, Lines 30-38*). Specifically, Kosanovic notes that a shorter update period does not allow

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for accurate background noise determination and could increase the chance of a determination error of a low energy signal level, thus implying that a lower signal level would require an increased update period. In order to correlate signal energy to an update period length, some type of threshold measurement would be inherently required. Since, according to the teachings of Kosanovic, increasing the updating period is concerned with determining a *lower* energy signal or parameter, it would be inherent that a signal level below a threshold would be required for the update period increase. Kosanovic further relates more frequent noise updates (decreased update period) to more frequent changes in signal level (*above a threshold of signal level change*) (*Col. 4, Lines 20-26*), and therefore, less frequent updates would occur (increased update period- no change to an original update period) when there is no level of signal change (below a threshold of signal level change). Thus, Kosanovic teaches the aforementioned claim limitation.

Also, the teachings of Kosanovic are concerned with adjusting a background noise updating period and not a transducer model, as is taught in the specification of the present invention (*Page 10*). Thus, the examiner notes that an amendment including updating a speech recognition model based on both a transducer and background noise models, wherein the updating period of both models are increased when successive changes in corresponding noise or transducer information do not exceed a threshold value, would overcome the prior art of record.

The dependent claims further limit rejected independent claims, and thus, also remain rejected.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1, 5, 9, 13-14, 16, 19, 21-22, and 24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Gong (U.S. Patent: 6,418,411) in view of Kosanovic (*U.S. Patent: 6,157,670*).

With respect to **Claims 1, 5, 9, and 13**, Gong discloses:

Determining parameters of a background model of a received voice request (*on-line noise compensation, Fig. 1, Elements 19-20; determining background noise parameters, Col. 2, Lines 35-47*);

Determining parameters of a transducer model (*one time adaptation, Fig. 1, Element 12; and calculating microphone (transducer) characteristics, Col. 1, Lines 59-62*);

Determining an adapted speech recognition model for a speech recognition model based on at least one of the background model and the transducer model (*producing an adapted model based on the inputs from the on-line noise estimation and the one-time adaptation (transducer adaptation), Fig. 1, Element 20 and Col. 2, Lines 44-50*).

Determining information in the voice request based on the adapted speech recognition model (*steps 4 and 5, Col. 2, Lines 58-61*);

Although Gong teaches the means for determining background noise model parameters, Gong does not teach that background noise is determined at a periodic time that can be adjusted based at least in part on determined changes in sampled noise information, however Kosanovic discloses an adjustable background noise update period based on a noise signal energy (*Col. 3, Lines 40-65*). Also, Kosanovic teaches increasing the periodic time when successive changes in sampled noise information does not exceed a threshold value (*Col. 4, Lines 20-26*).

Gong and Kosanovic are analogous art because they are from a similar field of endeavor in speech signal processing utilizing background noise estimation. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Gong with the adjustable background noise update period taught by Kosanovic in order to provide a means for obtaining background noise data according to a desired accuracy (*Kosanovic, Col. 3, Lines 52-65*).

With respect to **Claim 14**, Gong recites:

Determining user specific parameters of a background model for a received voice request (*on-line noise compensation, Fig. 1, Elements 19-20; determining background noise parameters, Col. 2, Lines 35-47; and speaker-adapted models, Fig. 1, Element 12*).

Determining parameters of a background model of a received voice request (*on-line noise compensation, Fig. 1, Elements 19-20; determining background noise parameters, Col. 2, Lines 35-47*);

Determining parameters of a transducer model (*one time adaptation, Fig. 1, Element 12; and calculating microphone (transducer) characteristics, Col. 1, Lines 59-62*);

Determining an adapted speech recognition model for a speech recognition model based on at least one of the background model and the transducer model (*producing an adapted model based on the inputs from the on-line noise estimation and the one-time adaptation (transducer adaptation)*), *Fig. 1, Element 20 and Col. 2, Lines 44-50*).

Determining information in the voice request based on the adapted speech recognition model (*steps 4 and 5, Col. 2, Lines 58-61*);

Although Gong teaches the means for determining user specific background noise model parameters, Gong does not teach that background noise is determined at a periodic time that can be adjusted based at least in part on determined changes in sampled noise information, however Kosanovic discloses an adjustable background noise update period based on a noise signal energy (*Col. 3, Lines 40-65*). Also, Kosanovic teaches increasing the periodic time when successive changes in sampled noise information does not exceed a threshold value (*Col. 4, Lines 20-26*).

Gong and Kosanovic are analogous art because they are from a similar field of endeavor in speech signal processing utilizing background noise estimation. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Gong with the adjustable background noise update period taught by Kosanovic in order to provide a means for obtaining background noise data according to a desired accuracy (*Kosanovic, Col. 3, Lines 52-65*).

With respect to **Claim 16**, Gong recites;

Sampling periods of speech inactivity while receiving the voice request (*speech pauses, Col. 5, Lines 29-32*).

With respect to **Claims 21 and 24**, Kosanovic discloses:

Dynamically determining the periodic time based, at least in part, on a magnitude of determined changes in the sampled noise information (*Col. 3, Lines 40-65*).

With respect to **Claim 22**, Kosanovic recites:

Increasing the periodic time when successive changes in sampled noise information does not exceed a threshold value (*Col. 4, Lines 20-26*).

5. **Claims 2-4, 6-8, 10-12, and 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Gong in view of Kosanovic, and further in view of Sejnoha (*U.S. Patent: 5,008,941*).

With respect to **Claims 2, 6, and 10**, Gong in view of Kosanovic teaches the speech recognition system utilizing background noise and transducer models, as applied to Claims 1, 5, and 9. Gong in view of Kosanovic does not specifically suggest that a transducer model is updated periodically, however Sejnoha teaches such a periodic transducer model update (*Col. 3, Lines 5-67; Col. 6, Line 41- Col.7, Line 17*).

Gong, Kosanovic, and Sejnoha are analogous art because they are from a similar field of endeavor in speech signal processing utilizing noise estimation. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Gong with the means for periodically updating a transducer model as taught by Sejnoha in order to implement more accurate speech recognition by tracking and compensating for time variant parameters that can degrade recognition performance (*Sejnoha, Col. 3, Lines 5-17*).

With respect to **Claims 3, 7, and 11**, Gong additionally discloses:



The parameters of the background model are determined based on a first sample period *(sample period for background noise estimation, Fig. 2, Col. 5, Lines 29-32).*

The parameters of the transducer model are determined based on a second sample period *(sample for a transducer model during a one time adaptation, which takes place before on-line adaptation and thus, inherently requires a second, distinct sampling period, Col. 5, Lines 23-28).*

With respect to **Claims 4, 8, and 12**, Gong additionally discloses:

Saving at least one of the parameters of the background model and the parameters of the transducer model *(background noise is recorded and estimated, Col. 2, Lines 43-44);*

Determining the adapted speech recognition model based on the at least one sample period and at least one of the background model and the transducer model *(after noise sampling, the system then proceeds to produce an adapted model based on the inputs from on-line noise compensation, Fig. 1, Element 19; and one-time adaptation (transducer adaptation), Fig. 1, Element 20; and Col. 2, Lines 44-50).*

With respect to **Claim 23**, Sejnoha teaches the means for periodically determining transducer data as applied to Claims 2, 6, and 10.

### ***Conclusion***

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Vahatalo et al (*U.S. Patent: 5,839,101*)- teaches an adjustable background noise estimation period delay.


8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632. The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached at (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James S. Wozniak  
2/15/2006



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